INCH-POUND

GL-PD-21-07
04 June 2021

PURCHASE DESCRIPTION

PANT, COMBAT, FLAME RESISTANT, ADVANCED, WITH INTEGRATED KNEEPADS

This Purchase Description is approved for use by DLA Troop Support and is available for use by Departments and Agencies of the Department of Defense (DoD).

1. SCOPE

1.1 Scope. This Purchase Description covers the requirements for the Advanced Flame Resistant, Combat, Pant, (ACP) with integrated kneepads to be worn by Military Services.

1.2 Size. The pant sizes are as follows:

SCHEDULE OF SIZES

X Small	Small	Medium	Large	X Large	XX Large
X Short	X Short	X Short	----	----	----
Short	Short	Short	Short	Short	Short
Regular	Regular	Regular	Regular	Regular	Regular
Long	Long	Long	Long	Long	Long
----	----	----	X Long	X Long	X Long

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

Comments, suggestions, or questions on this document should be addressed to: Department of the U.S. Army Combat Capabilities Development Command (DEVCOM), Soldier Center ATTN: FCDD-SCD-PE, 10 General Greene Avenue, Natick, MA 01760-5019.

AMSC N/A FSC 8415

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

COMMERCIAL ITEM DESCRIPTIONS

A-A-50198	Thread, Gimp, Cotton, Buttonhole
A-A-55126	Fastener Tape, Hook and Loop, Synthetic
A-A-55195	Thread, Para-Aramid, Spun, Intermediate Modulus
A-A-55217	Thread, Aramid, Spun, Staple
A-A-59994	Button, Sewing Hole, and Button, Staple, (Plastic)

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-5038	- Tape, Textile and Webbing, Textile, Reinforcing Nylon
MIL-W-5664	- Webbing, Textile Elastic
MIL-DTL-32075	- Label: For Clothing, Equipage, and Tentage (General Use)
MIL-PRF-32635	- Cloth Flame Resistant

(Copies of these documents are available online at https://quicksearch.dla.mil.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those specified in the solicitation or contract.

FEDERAL TRADE COMMISSION (if applicable)

16 CFR Part 303 Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies of this document are available online at https://www.ftc.gov.)

(Copies of specifications, standards, drawings and publications required by contractors in connection with specification procurement functions should be obtained from the procuring activity or as directed by the Contracting Officer.)

PURCHASE DESCRIPTIONS

GL-PD-10-08	-	Patch Kit, Integrated, Flame Resistant (IPK)
GL-PD-21-02	-	Kneepads, Advanced, Integrated (AIKP)

(Copies of these documents are available through the contracting activity.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those specified in the solicitation or contract (see 6.2).

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC EP1 - Evaluation Procedure for Gray Scale for Color Change
AATCC EP2 - Evaluation Procedure for Gray Scale for Staining
AATCC EP9 - Evaluation Procedure for Visual Assessment of Color Difference of Textiles
AATCC TM20 - Test Method for Fiber Analysis: Qualitative
AATCC TM61 - Test Method for Colorfastness to Laundering: Accelerated
AATCC TM81 - Test Method for pH of the Water-Extract from Wet Processed Textiles
AATCC TM135 - Test Method for Dimensional Changes of Fabrics after Home Laundering

(Copies of these documents are available online at https://www.aatcc.org.)

AMERICAN SOCIETY FOR QUALITY (ASQ)

ASQ/ANSI Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies of this document are available online at https://asq.org.)

ASTM INTERNATIONAL

ASTM D737 - Standard Test Methods for Air Permeability of Textile Fabrics
ASTM D1424 - Standard Test Methods for Tearing Strength of Fabrics by Falling-Pendulum Type (Elmendorf) Apparatus
ASTM D1777 - Standard Test Method for Thickness of Textile Materials
ASTM D3774 - Standard Test Method for Width of Textile Fabrics
ASTM D3775 - Standard Test Method for Warp End Count and Filling Pick Count of Woven Fabrics
ASTM D3776/D3776M - Standard Test Methods for Mass Per Unit Area (Weight) of Fabric
ASTM D3787 - Standard Test Method for Bursting Strength of Textiles-Constant-Rate-of-Traverse (CRT) Ball Burst Test
ASTM D3884 - Standard Guide for Abrasion Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)
ASTM D3990 - Standard Terminology Relating to Fabric Defects
ASTM D5034 - Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
ASTM D5169 - Standard Test Method for Shear Strength (Dynamic Method) of Hook and Loop Touch Fasteners
ASTM D5170 - Standard Test Method for Peel Strength (T Method) of Hook and Loop Touch Fasteners
ASTM D6193 - Standard Practice for Stitches and Seams
ASTM D6413/D6413M - Standard Test Method for Flame Resistance of Textiles (Vertical Test)

(Copies of these documents are available online at https://www.astm.org.)

OTHER PUBLICATIONS

Fabric Defect Replica Scales

(For information on obtaining copies of the Fabric Defect Replica Scales please contact U.S. Army Combat Capabilities Development Command (DEVCOM), Soldier Center, ATTN: FCDD-SCD-PE, 10 General Greene Avenue, Natick, MA 01760-5019.)

INFORMA HEALTHCARE

Repeat Insult Patch Test - Modified Draize Procedure –
Principles and Methods of Toxicology, A Wallace Hayes (editor).

(Copies of this document are available online at https://www.crcpress.com.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Unless a specific exemption has been obtained, nothing in this document, supersedes applicable laws and regulations.

3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Design. The pant shall have a waistband with clean finished ends with seven (7) belt loops, hook/loop adjustment tabs, and button/buttonhole closure (see Figure 3). The pants shall have a covered fly with three (3) buttons and buttonhole closure. The pants shall have two (2) side hanging pockets, two (2) back single welt hip pockets with two (2) button closure flaps, two (2) front side pleated cargo pockets with three (3) button/two (2) buttonhole closure flaps and two (2) lower leg pockets with hook and loop closure flaps (see Figure 1). The pant is a field pant that interfaces with the Advanced Integrated kneepads (AIKP), GL-PD-21-02. It shall have an adjustable waistband with belt loops, a button-fly, a two-ply reinforced seat, a draw cord hem, a kneepad housing with adjustable tabs (see Figure 4), kneepad height adjuster, and four (4) different types of pockets. On the front there are two (2) front hanging pockets. On the outsides, on the upper thigh there shall be a cargo pocket, and on the lower leg shall be a bellows pocket (see Figures 1 and 2). The back right and left shall each have a single welt pocket with flaps.

3.3.1 Figures. Figures 1 through 4 are furnished for informational purposes only. To the extent of any inconsistencies between the written document and the figure, the written document shall govern.

3.4 Materials.

3.4.1 Basic material. The basic material for the pant shall be a Flame Resistant (FR) twill cloth in Operational Camouflage Pattern (OCP) or other pattern as specified in a solicitation or contract, conforming to the physical requirements specified for Type IV, Class 1 of MIL-PRF-32635 (see 6.2).

3.4.2 Stretch material. The cloth for the crotch gusset and knee adjustment tabs shall be an FR twill or plain weave cloth with two-way stretch in OCP or other pattern as specified in a solicitation or contract, conforming to the physical requirements listed in Table I, when tested as specified in 4.4.2, and all other requirements as specified for Type IV, Class 1 of MIL-PRF-32635 (see 6.2).

3.4.3 Abrasion resistant material. The cloth for the seat reinforcement panel shall be an FR twill cloth with abrasion resistant finish in OCP or other pattern as specified in a solicitation or contract, conforming to the physical requirements listed in Table I, when tested as specified in 4.4.2, and all other requirements as specified for Type IV, Class 1 of MIL-PRF-32635 (see 6.2).

TABLE I. Physical requirements.

Characteristic	Requirement	
	Stretch Material	Abrasion Resistant Material
Weight, oz./sq.yd.		
Minimum	6.0	6.3
Maximum	7.0	7.3
Yarns per inch, (minimum)		
Warp	--	60
Filling	--	50
Breaking strength, pounds (minimum)		
Warp	--	110
Filling	--	100
Tearing strength, pounds (minimum)		
Warp	--	6.0
Filling	--	6.0
Bursting Strength, pounds (minimum)	125.0	--
Abrasion Resistance, cycles (minimum)		
Cycles before appreciable wear	--	500
Dimensional Stability, percent		
After laundering 5 cycles (maximum)		
Warp and Filling:		
Individual Sample	--	4.0
Lot Average	6.0	3.5

TABLE I. Physical requirements. - Continued

Characteristic	Requirement	
	Stretch Material	Abrasion Resistant Material
Air permeability, cu.ft./min./sq.ft. (minimum)	25.0	--
Flame Resistance:		
Initial -		
After Flame, seconds (maximum)	2.0	2.0
After Glow, seconds (maximum)	15.0	15.0
Char Length, inches (maximum)	4.5	4.5
Flame Resistance:		
After laundering (25 cycles)		
After Flame, seconds maximum)	2.0	2.0
After Glow, seconds (maximum)	15.0	15.0
Char Length, inches (maximum)	4.5	4.5

3.4.4 Cloth, front and hip pockets.

3.4.4.1 Cloth, front pockets. The cloth for front pockets shall be basic material as described in 3.4.1.

3.4.4.2 Cloth, hip pockets. The cloth for hip pockets shall be basic material as described in 3.4.1 or printed seconds. Seconds shall be cloth which has been rejected only for defect pertaining to color, infrared reflectance, or camouflage printed pattern as specified in MIL-PRF-32635 (Types I - IV) as applicable.

3.4.5 Waistband interlining. The cloth for the interlining shall be a nonwoven blend of polyester and cellulose (see 6.3). The total weight shall be no less than 1.35 ounces per square yard and no more than 2.2 ounces per square yard. The color shall be white and the hand shall be stable and medium stiff. The testing shall be as specified in 4.4.2. The interlining may be fusible or non-fusible.

3.5 Components. The color for all components in 3.5.1.1 through 3.5.1.5 and 3.5.2 through 3.5.6 shall match Tan 499 when tested as specified in 4.4.2, unless otherwise specified.

3.5.1 Tape, cord and elastic.

3.5.1.1 Barrel lock and hem tape (drawstring). The tape for the barrel lock and leg bottom hem shall conform to MIL-PRF-5038, Type III, 3/8-inch wide. The tape for attaching the barrel lock shall be cut 2-1/4-inches in length (±1/4-inch) so that when folded it finishes 3/4 (- 0, + 1/8) inch in length. The drawstring tape for the leg bottom hem shall be cut 29 (- 0, + 1) inches in length for all sizes. The tape ends shall be heat cut to prevent raveling and the ends of the bottom hem drawstring tape shall be finished with knotted ends.

3.5.1.2 Knee pad adjustment tape. The tape for the vertical knee pad adjustment shall be 3/4- inch wide conforming to Type III of MIL-PRF-5038. The tape ends shall be heat cut to prevent raveling. The tape for the knee pad adjustment buckle attachment shall be 3-inches long. The tape lengths for the knee pad adjustment straps shall be as follows:
X Small – 11 inches, Small – 12 inches, Medium – 13 inches, Large – 14-inches,
X Large – 15-inches, XX Large – 16-inches.

3.5.1.3 Waist tab tape. The tape for the waist adjustment tabs shall be 1-inch wide and 5-inches long (± 1/8 inch), conforming to Type III of MIL-PRF-5038. The tape ends shall be heat cut to prevent raveling.

3.5.1.4 Elastic. The elastic for the waistband adjustment tabs shall be 1-inch wide and 2-1/2 - inches long (± 1/8) inch, conforming to MIL-W-5664. Either Type I or Type II is acceptable.

3.5.1.5 Cord, elastic (draw cord). The elastic cord for the cargo pockets shall have a 1/8 (- 0, +1/32) inch diameter. The elastic cord properties shall be as follows: weight 0.20 ounces per linear yard, elongation 120 (± 10) percent, 55 picks per inch minimum, 16 carriers, 3 ends/carrier, 12 elastic strands minimum and polyester cover yarn. The cord cut length shall be 14 (± 3/4) inches and shall be heat cut.

3.5.2 Barrel lock. The barrel locks shall maintain a 3-pound minimum holding strength on elastic cord (see 4.5.1 and 3.5.1.5) when tested in accordance with 4.4.3. The barrel lock shall be 1/2-inch x 3/8-inch elliptical or 3/8-inch round shape, push-button size to easily operate with gloves. The barrel lock shall also provide/possess a separate fixed location for attachment of the webbings specified in 3.5.1.1. Barrel lock shall be set for customer use before packaging.

3.5.3 Fastener tape, hook and loop. The hook and loop fastener tape shall conform to Type II, Class 1 or Class 4 of A-A-55126. The widths shall be as specified for each application throughout this purchase description. The fastener tape, hook and loop, shall be consistent in manufacturer within a garment.

3.5.3.1 Fastener tape, hook and loop use. The use of hook and loop with and without selvage within a garment is allowed (does not need to be consistent within the garment). For hook and loop with selvage: slits, split edges or any splicing of fastener tape shall not be permitted. Hook and loop without selvage shall be heat slit along edges by hook and loop manufacturer only and shall not fray and shall meet the requirements of A-A-55126.

3.5.4 Thread. The thread for all seaming and stitching shall be as specified in Table II. All thread shall be non-staining and the requirements in each respective Commercial Item Description (CID) shall apply.

TABLE II. Thread requirements, all types.

Component area	Thread specification	Needle thread (Tex size)	Bobbin/ Looper thread (Tex size)
All seaming except small parts	A-A-55195, Type I A-A-55195, Type II A-A-55217, Type I	78 59 60	78 59 60
Bartacks, and small parts, (hook and loop, pockets, flaps, top stitching, tabs, hems and eyelets) and labels	A-A-55195, Type I A-A-55195, Type II A-A-55217, Type I	59 20 40	59 20 40
Overedge/Serge for raw edge cover	A-A-55195, Type I A-A-55195, Type II A-A-55217, Type I	39 16 40	39 16 40
Crotch seam, gusset and seat patch	A-A-55195, Type I A-A-55195, Type II A-A-55217, Type I	78 59 60	78 59 60
Button attachment	A-A-55195, Type I A-A-55195, Type II A-A-55217, Type I	59 39 40	59 39 40

3.5.5 Gimp. The cotton gimp for reinforcing buttonholes shall conform to A-A-50198, soft or glazed finish, Tex Size 180 or 210.

3.5.6 Buttons. Buttons shall be dull finish, four (4) holes, 30 ligne conforming to A-A-59994, Type I, Class 1, Style 26. When attached to the pant, the button and thread shall withstand 40 pounds (minimum) when tested as specified in 4.4.3.

3.5.7 Patch Kit, Integrated (IPK). The IPK shall conform to the requirements of GL-PD 10-08, Operational Camouflage Pattern (OCP) uniforms shall use Class 3, Size R.

3.5.8 Flat buckle. The kneepad adjustment tape shall be secured with a flat cam buckle, 3/4-inch width opening, outside width 1-inch. The color shall be black.

3.6 Construction. All material edges shall be clean finished, either, turned-in, turned-under or serged unless otherwise indicated. All components with a grain line shall follow the grain line of the basic garment material or as indicated on pattern.

3.6.1 Fastener tape, (hook and loop). All widths of hook and loop tape (see 3.5.3) shall be sewn 1/8 to 3/16-inch from tape edge to prevent needle cutting along edges, stitching runoffs or improper fit into automatic sewing equipment. To prevent raveling on fastener tape with selvage, do not sew directly on the selvage. Under no circumstances shall any fastener tape be re-stitched for repair purposes. New tape shall be used for repairs to prevent needle cutting, thus offering maximum field life. All fastener tape maybe sewn through all layers on pant as indicated on the figures (see patterns for placement). Tolerance for all cut lengths of fastener tape shall be (± 1/8) inch.

3.6.2 Waistband. The finished waistband shall be straight and self-faced with adjustment tabs on the sides and a button/buttonhole closure. It shall measure 2-1/4 (+ 1/8) inches wide. The width of the waistband shall be consistent so that the right and left sides match each other in width at the front within 3/16-inch. The adjustment tab assembly shall consist of a 2-3/4-inch length of 1-inch-elastic, a 5-inch length of 1-inch-webbing, 4-inch length of 1-inch-loop tape, and 2-inch length of hook tape. A tab shall be created from the elastic, webbing, and hook that will engage with the loop tape. The elastic and webbing shall be overlapped 1-inch and box-stitched together. The loop shall be applied to the opposite end of the webbing with a box stitch. The finished tab shall measure 6-1/2-inches. The elastic end of each tab shall be attached inside the waistband with a bar tack that goes through all layers, as marked on the pattern. The hook-backed-end of the tab shall be threaded to the outside of the waistband through a buttonhole. The hook end of the tab shall face the waistband. The loop tape shall be edge stitched to the waist band through all layers, in accordance with pattern markings. In the relaxed position the tab shall overlap the loop tape by 2-inches. (See Figure 3).

3.6.3 Belt loop. The Pant shall have seven (7) belt loops. They shall measure 3/4 (± 1/8) inch in finished width, and finish 2-1/2 (± 1/8) inches from top to bottom fold in the length. The bottom fold shall extend 3/8-inch below the bottom of waistband. The belt loops shall be placed as indicated on the patterns. However, the front belt loops shall cover/hide the buttonholes and bartacks for the waist adjustment tabs and a belt loop may be positioned immediately adjacent to seams to reduce bulk in sewing. (See Figures 1 and 3).

3.6.3.1 Waistband front button closure. Attach button for front button closure in line with the edge stitch of the seam connecting front fly right and front right leg top. Keyhole opening of the front buttonhole for buttonhole closure should be 3/4-inch from the finished edge of the left front side of the waistband. (See Figures 1 and 3).

3.6.4 Fly. The pant fly shall be a covered fly with three (3) buttons and buttonhole closure for all sizes. The buttonholes shall be horizontal and placed as indicated on the pattern. The fly shall have two rows of "J" stitching, 2 (± 1/8) inches from fly edge to outside needle. The top fly shall be edge stitched 1/16 to 1/8-inch (see Figure 1).

3.6.5 Seat patch. The pant shall have a double-needle seat patch (see pattern for placement).

3.6.6 Kneepad housing. The pant shall have a kneepad housing on each leg, for removable, hard shell kneepads. The housing shall have a flap, a horizontal aperture at the midpoint, and an open bottom tacked down with a centered vertical bar tack. The sides, top and bottom of the housing and the aperture seam shall be top stitched. The inside of the aperture shall have two (2) 4-1/2-inch lengths of 5/8-inch- wide hook and loop so that the inner and outer layers of the housing will stick together when the housing is empty. The lengths of hook and loop tape shall straddle the aperture. The flap and top opening of the knee pad housing shall have a closure using 5/8-inch wide hook and loop tape. The loop portion shall be stitched to the bottom edge of the flap, while the corresponding hook tape shall be stitched on the outside of the housing body. The hook and loop tape shall be long enough to be caught in the vertical seams of the Kneepad housing (see Figure 4).

3.6.7 Pockets and flaps. All pockets shall have eyelet drainholes as specified in the pattern and 3.6.11.1.

3.6.7.1 Front pockets. The pant shall have two (2) front pockets with pocket openings measuring 7-1/2 (± 1/2) inches between bar tacks. Pocket openings shall match each other within 1/4-inch. Any raw edge shall be overedge stitched.

3.6.7.2 Hip pockets. The pants shall have two (2) single-welt hip pockets with flaps. The flaps shall have two (2) covered buttonholes that shall engage with two (2) buttons on the pocket. The pockets shall be placed on the upper back panels in accordance with pattern markings. The pocket opening shall measure 3/8 (± 1/16) inch wide and 5-3/4 (± 1/16) inch long. The finished welt shall measure 1/4 (± 1/16) inch wide. The flap shall fit flush and flat within the pocket opening. The hip pocket construction shall have single row top stitching above and below the welt pocket opening. Finished, the rows of top stitching shall be spaced 5/8 (± 1/16) inch from each other. The buttons shall be sewn onto the outside of the pocket and the buttonholes shall be vertical and sewn into the underside of the flap as indicated on patterns. (See Figure 1).

3.6.7.3 Cargo pockets and flaps. The pant shall have two (2) pleated bellows cargo pockets with flaps (see pattern for placement). The pockets shall have a sewn-in eyelet at the bottom side edge of bellow, as indicated on the pattern and 3.6.11.1. The pockets shall have an elastic draw cord (see 3.5.1.5) inserted through eyelets at the top of pocket hem with a barrel lock (see 3.5.2) for adjustment. The barrel lock shall be attached to the inside of the cargo pocket with a piece of folded webbing (see 3.5.1.1). The elastic cord shall be securely fastened between both layers of fabric with two (2) bar tacks (see Table VI). The elastic cord shall be threaded so that the tail of the elastic remains inside the pocket when cinched, shall be firmly clasped in the barrel lock with a single knot when closed and shall pull smoothly through barrel lock when open. The top of the folded finished pocket flaps shall finish 3/8-inch from the folded edge of pocket top (inside measurement, see pattern for placement). A 1-inch flat buckle (see 3.5.8) shall be attached inside the pocket with a webbing loop inserted in the pocket flap seam (see pattern for placement). Finished length of the loop shall be 1-inch. The pleated bellows shall be edge stitched to secure pleat stability. The cargo pockets and flaps shall close with a three (3) button, two (2) buttonhole closure per pocket. The buttons shall be sewn onto the outside of the pocket and the buttonholes shall be vertical and sewn onto the underside of the flap as indicated on patterns. (See Figures 1 and 2).

3.6.7.4 Lower leg pockets and flaps. The pant shall have two (2) lower leg bellows pockets with flaps. The pockets shall have a sewn-in eyelet at the bottom of the bellow, as indicated on pattern (see 3.6.11.1 and 3.6.11.2 and Figure 2). The top of the lower leg pocket shall be placed five (5) inches down from the back lower and back upper joining seam, measured along the side seam, the front edge of the lower leg pocket shall be 1-inch away from the seam joining the outer knee wing and knee pad pass through. The sides of the lower leg pocket shall be parallel with the side seam. The lower leg pocket flap shall be placed 3/8-inch above the lower leg pocket (measured from the top edge of the lower leg pocket to the lowest row of top stitching on the lower leg pocket flap). The pockets shall close with one (1) piece of loop fastener tape cut 1-inch wide by 3-1/2 inches long sewn to the underside of pocket flap and two (2) pieces of hook fastener tape cut 1-inch wide by 1-inch long sewn to the outer side of pocket hem as indicated on pattern. (See Figure 1).

3.6.8 Kneepad adjustment tabs/tapes.

3.6.8.1 Horizontal kneepad adjustment tabs. Horizontal adjustment tabs shall be attached in the inseam and outseam as indicated in the pattern. Tabs shall have a finished width of 1-1/4 inches. Attachment shall be reinforced with bartacks as indicated in Table VI. Hook tape 1-inch by 1-1/2-inches (±1/8 inch) shall be attached to each tab 1/4-inch from the end and sides. Loop tape 1-inch wide shall be attached to the back leg as indicated in the pattern. The loop tape on the back of the knee shall be 1-inch wide with lengths as follows:

Garment Size	Loop tape length (inches)
X-Small	8
Small	9
Medium	9 1/2
Large	10
X-Large	11
XX-Large	11 1/2

3.6.8.2 Vertical knee pad adjustment tapes. A flat buckle shall be attached to vertical adjustment tapes, which shall be attached to the top edge of the kneepad pocket inside the leg of the pant. The tape shall be threaded through a buttonhole placed as indicated in the pattern into the cargo pocket and attached to the flat buckle in the cargo pocket in order to provide vertical adjustment for the kneepads.

3.6.9 Leg bottom and hem. The pant leg bottoms shall be hemmed and shall have a drawstring inserted through two (2) sewn-in eyelets or two (2) 1/2-inch horizontal straight cut buttonholes with reinforcement piece as indicated on patterns (see 3.8). The drawstring tape (see 3.4.1.1) shall overlap (cross) between holes when threaded through the hem casing. The drawstring shall be heat sealed and knotted at each end before packaging. The finished hem shall measure 7/8 (± 1/8) inch wide on the outside.

3.6.10 Buttonholes. The buttonholes shall be eyelet-end tapered bar type worked over gimp for the fly, back hip welt pocket flaps, cargo pocket flaps with not less than four (4) tacking stitches at bar end catching the gimp ends (not counting the crossover stitch). The purling shall be on the outside surface. The cut lengths shall be set at 3/4-inch. The buttonholes shall be clean cut with the stitching securely caught in fabric. When buttonholes are used in lieu of sewn in eyelets (see 3.6.11.3) for the leg bottom hem drawstrings they shall be 1-inch, vertical, straight cut for the waistband and 1/2-inch, horizontal, straight cut for the leg bottom hem. Buttonholes for the vertical kneepad adjustment tabs/tapes shall be 1-1/8 inch, horizontal straight cut.

3.6.11 Eyelets.

3.6.11.1 Pocket drainholes (all). All pockets shall have sewn-in eyelets for drainage at the bellows. The drain eyelets shall have a 1/4 (± 1/16) inch diameter finished opening. Placement of the drain eyelets shall be 1/4-inch above the bottom edge of the pocket unless otherwise noted on the pattern.

3.6.11.2 Cargo pocket (top of pocket hem). The sewn-in eyelets for the cargo pocket top of pocket hem shall have a 1/4 (± 1/16) inch diameter finished opening.to accommodate the elastic draw cord (see 3.5.1.5).

3.6.11.3 Leg bottom. When sewn-in eyelets are used for the leg bottom opening, they shall have a 3/8 (± 1/8) inch diameter finished opening. Eyelets should be positioned so as to not be visible from the front and should be inside the bottom hem.

3.6.12 Patch Kit, Integrated (IPK). The IPK shall meet the requirements of GL-PD-10-08. The pant shall have an IPK placed into the finished left hip pocket, as worn. The IPK shall be placed loosely in the pocket of the finished garment with the shortest dimension vertical and shall lie flat after placement in pocket. The pocket flap shall be secured with at least one button to prevent IPK from falling out (see 6.4).

3.7 Labels. Each pant shall have a combination identification/care label and a size label. The labels shall be sewn in labels conforming to Type VI of MIL-DTL-32075. The color of the labels shall be white. The printing for all labels shall be black. The inscription shall have a minimum font size of 8 points for the identification/care label only. The font for the size label shall be 10 points. The inscription legibility, label and label attachment shall last the expected life of the pants.

3.7.1 Size label. The size label shall conform to Type VI, Class 2 of MIL-DTL-32075, and shall be sewn and caught in the bottom of the inside waistband seam, 1-1/2 inch to the right of the center back seam as the garment is worn. The stitching shall not cover the printing. The size label shall include the information in Table IIIA or Table IIIB for the applicable size.

TABLE IIIA. Size label information – smaller sizes.

X Small – X Short Waist: Up to 27 in. Inseam: Up to 26 1/2 in. NSN No. NATO Size: 6067/5869	Small – X Short Waist: 27 to 31 in. Inseam: Up to 26 1/2 in. NSN No. NATO Size: 6067/6979	Medium – X Short Waist: 31 to 35 in. Inseam: Up to 26 1/2 in. NSN No. NATO Size: 6067/7989
X Small – Short Waist: Up to 27 in. Inseam: 26 1/2 to 29 1/2 in. NSN No. NATO Size: 6775/5869	Small – Short Waist: 27 to 31 in. Inseam: 26 1/2 to 29 1/2 in. NSN No. NATO Size: 6775/6979	Medium – Short Waist: 31 to 35 in. Inseam: 26 1/2 to 29 1/2 in. NSN No. NATO Size: 6775/7989
X Small – Regular Waist: Up to 27 in. Inseam: 29 1/2 to 32 1/2 in. NSN No. NATO Size: 7583/5869	Small – Regular Waist: 27 to 31 in. Inseam: 29 1/2 to 32 1/2 in. NSN No. NATO Size: 7583/6979	Medium – Regular Waist: 31 to 35 in. Inseam: 29 1/2 to 32 1/2 in. NSN No. NATO Size: 7583/7989
X Small – Long Waist: Up to 27 in. Inseam: 32 1/2 to 35 1/2 in. NSN No. NATO Size: 8390/5869	Small – Long Waist: 27 to 31 in. Inseam: 32 1/2 to 35 1/2 in. NSN No. NATO Size: 8390/6979	Medium – Long Waist: 31 to 35 in. Inseam: 32 1/2 to 35 1/2 in. NSN No. NATO Size: 8390/7989

TABLE IIIB. Size label information – larger sizes.

Large – Short Waist: 35 to 39 in. Inseam: 26 1/2 to 29 1/2 in. NSN No. NATO Size: 6775/8999	X Large – Short Waist: 39 to 43 in. Inseam: 26 1/2 to 29 1/2 in. NSN No. NATO Size: 6775/9909	XX Large – Short Waist: 43 to 47 in. Inseam: 26 1/2 to 29 1/2 in. NSN No. NATO Size: 6775/0919
Large – Regular Waist: 35 to 39 in. Inseam: 29 1/2 to 32 1/2 in. NSN No. NATO Size: 7583/8999	X Large – Regular Waist: 39 to 43 in. Inseam: 29 1/2 to 32 1/2 in. NSN No. NATO Size: 7583/9909	XX Large – Regular Waist: 43 to 47 in. Inseam: 29 1/2 to 32 1/2 in. NSN No. NATO Size: 7583/0919
Large – Long Waist: 35 to 39 in. Inseam: 32 1/2 to 35 1/2 in. NSN No. NATO Size: 8390/8999	X Large – Long Waist: 39 to 43 in. Inseam: 32 1/2 to 35 1/2 in. NSN No. NATO Size: 8390/9909	XX Large – Long Waist: 43 to 47 in. Inseam: 32 1/2 to 35 1/2 in. NSN No. NATO Size: 8390/0919
Large – X Long Waist: 35 to 39 in. Inseam: 35 1/2 to 38 1/2 in. NSN No. NATO Size: 9098/8999	X Large – X Long Waist: 39 to 43 in. Inseam: 35 1/2 to 38 1/2 in. NSN No. NATO Size: 9098/9909	XX Large – X Long Waist: 43 to 47 in. Inseam: 35 1/2 to 38 1/2 in. NSN No. NATO Size: 9098/0919

3.7.2 Combination identification/care label. The combination identification/care label shall conform to Type VI, Class 15 of MIL-DTL-32075 and shall be placed on the inside of the right hip pocket as worn, so that the label shall face the wearer. The label shall be sewn on all four sides and the stitching shall not cover the printing or penetrate the trouser front. The label shall include the following information:

THIS SPACE LEFT INTENTIONALLY BLANK

<table>
<tr><td colspan="2">PANT COMBAT FLAME RESISTANT, ADVANCED,
WITH INTEGRATED KNEEPADS</td></tr>
<tr><td colspan="2">CONTRACT NO: XXXXX-XX-X-XXXX
FIBER CONTENT: 1/
MADE IN USA
CONTRACTOR: XXXXXXXXXXXXXX.
LOT NUMBER: 2/</td></tr>
<tr><td colspan="2">This product meets the manufacturing and performance testing requirements as authorized by the Program Executive Office - Soldier</td></tr>
<tr><td> 
</td><td>REMOVE KNEE PADS
BEFORE CLEANING
MACHINE WASH COLD OR WARM, PERM PRESS CYCLE
TUMBLE DRY LOW OR MEDIUM HEAT
USE DETERGENT ONLY, DO NOT USE SOAP
DO NOT USE BLEACH, FABRIC SOFTENER OR STARCH
DO NOT DRY CLEAN OR USE COMMERCIAL HOT PRESSING DO NOT IRON
HOOK & LOOP FASTENERS LIGHTLY BRUSH HOOK & LOOP TO REMOVE DEBRIS</td></tr>
<tr><td colspan="2">DO NOT REMOVE THIS LABEL
THIS GARMENT IS FLAME RESISTANT</td></tr>
</table>

1/ Per Rules and Regulation Under the Textile Fiber Products Identification Act.
2/ The lot number shall be stamped with indelible black ink prior to shipment.

3.7.3 Barcode label. Each pant shall have a barcode label conforming to Type VIII, Class 17 of MIL-DTL-32075. The label shall be Swift tacked in the side seam (±1/4) -inches below the belt loop. The bar coding element shall be a 13-digit National Stock Number (NSN). There shall be a 12-digit Universal Product Code (UPC) number assigned for all NSNs by the contracting activity. The initials "UPC" must appear beneath the code. The bar code for NSN and UPC type shall be a medium to high density and shall be located so that it is completely visible on the pant when it is folded and/or packaged as specified and so it causes no damage to the pant.

3.8 Patterns. The Government will furnish a complete set of patterns or a master pattern with grade rules to maintain uniformity and consistency in manufacturing. The Government patterns shall be used to create the contractor's working patterns. Minor pattern modifications are permitted to accommodate manufacturing procedures however the design and finished

measurements must be obtained. Pattern guidelines shall not be modified. Adhesive patterns are prohibited. The Government patterns provide a seam allowance of 3/4-inch for outseams, seat seam, and where double lap seams are required, 1/2-inch seams at lower front knee, 3/8-inch allowance for all other seams, except where otherwise specified, and 1/4-inch allowance for leg tabs and pocket flaps. Pockets, pocket flaps, kneepatches, hook and loop fastener tape, buttons, buttonholes, and bar tacks shall be located in accordance with marks on patterns and table references. Pattern parts shall be as listed in Table IV.

TABLE IV. List of pattern parts.

	Piece Name	Piece Description	Cut
Fabric Basic (See 3.4.1)	PD21_07-FRONT-UPPER	FRONT UPPER	2
	PD21_07-FRONT-LOWER	FRONT LOWER	2
	PD21_07-BACK-UPPER	BACK UPPER	2
	PD21_07-BACK-LOWER	BACK LOWER	2
	PD21_07-WSTBND	WAISTBAND	1
	PD21_07-KNEE-FR-FLAP	KNEE FRONT FLAP	4
	PD21_07-KNEE-FR-UPPER	KNEE FRONT UPPER	4
	PD21_07-KNEE-FR-LOWER	KNEE FRONT LOWER	4
	PD21_07-KNEE-BACK	KNEE BACK	2
	PD21_07-KNEE-WING-OUT	KNEE WING OUTSEAM SIDE	2
	PD21_07-KNEE-WING-IN	KNEE WING INSEAM SIDE	2
	PD21_07-FLY-LFT-BTM	FLY LEFT BOTTOM	1
	PD21_07-FLY-LFT-TOP	FLY LEFT TOP	1
	PD21_07-FLY-RIGHT	FLY RIGHT	1
	PD21_07-BELT-LOOP	BELT LOOP	1
	PD21_07-CARGO-POCKET	CARGO POCKET	2
	PD21_07-CRGPKT-FACNG	CARGO POCKET FACING	2
	PD21_07-CRGOPKT-FLAP	CARGO POCKET FLAP	2
	PD21_07-FRONT-POCKET	FRONT POCKET	2
	PD21_07-HIP-POCKET	HIP POCKET	2
	PD21_07-HIPPKT-FACNG	HIP POCKET FACING	2
	PD21_07-HIP-PCKT-BR	HIP POCKET BR	2
	PD21_07-HIP-PKT-FLP	HIP POCKET FLAP	2
	PD21_07-LOWLEG-PKT	LOWER LEG POCKET	2
	PD21_07-LOW-LEG-FLP	LOWER LEG FLAP	2
Fabric Stretch (See 3.4.2)	PD21_07-GUSSET	GUSSET	1
	PD21_07-BCK-LEG-TAB	BACK LEG TAB	4
Fabric Abrasion Resistant (See 3.4.3)	PD21_07-SEAT-PATCH	SEAT PATCH	2
Fabric Interlining (See 3.4.5)	PD21_07-WSTBNDFUS	WAISTBAND INTERFACING	1
Templates	PD21_07-WSTBND-MPLT	WAISTBAND TEMPLATE	1

3.9 Configuration. Each pant shall conform to appearance (see Figures 1-4), the finished measurements in Table VII (as applicable) and the construction methods specified in 3.9.1 through 3.9.2 and Tables V and VI in order to maintain configuration compliance.

3.9.1 Seams and stitching. All seams shall be consistent and exhibit a uniform appearance and conform to the ASTM D6193 seam and stitch types listed in Table V. The backside of seams (inside garment) shall be flat with no protruding seam allowance to create irritation or discomfort. All material edges shall be clean finished, either, turned-in, turned-under or serged. All pocket flaps shall be serged prior to setting. Needle and bobbin thread tension shall be balanced such that neither is too tight nor too loose relative to each other. The seams for all outside visible stitching shall be sewn with 10 (± 2) stitches per inch. Overedge or pre-hemming shall be 8 (± 2) stitches per inch. Hook and loop tape shall be sewn with 10 (± 2) stitches per inch. Buttons shall be attached with 16 stitches per button. The sewn eyelets for the bellows pockets shall have a minimum of 16 stitches. All stitches per inch and gauges shall be met prior to treatment.

3.9.1.1 Fly seaming and stitching. The fly construction stitching of front center crotch seam shall end at J-stitch. There shall be a horizontal bartack superimposed on the bottom point of the J- stitch. A second horizontal bartack shall be placed a minimum of 1/4-inch below the lowest button/ buttonhole.

TABLE V. Seam and stitching types.

Seam Placement	**Seam type**	**Gauge**	**Stitch type**
Side seams, back rise seam, back leg seams and inseam	LSc-2	3/16 to 9/32-inch gauge	301 401
Alternate	or Ssa-1 LSq-3	Overedge 1/8 to 3/16-inch gauge, then Topstitch 3/16 to 9/32-inch gauge	504 301 401
Top stitching of pocket flaps and side pockets	OSf-1	3/16 to 1/4-inch from edge	301
Attachment of pockets	LSd-1	1/16 to 1/8-inch from edge	301
Attachment of cargo and lower leg pocket flaps	LSd-2	Two rows 3/16 to 1/4-inch apart	301
All raw edges of pocket bagging, bearer or facings. (unless secured inside seam with topstitching)	Ssa-2	1/4 to 3/8-inch gauge	516, 519
Raw edges of pocket flaps	Ssa-1	3/16-1/4 inch gauge	504
Knee pad pocket, center seam	LSc-2 or Efd-1/LSq-3	3/16-1/4 inch gauge	301 or 401
Knee pad pocket, knitted loop attachment	SSc-2	3/16-1/4 inch gauge, on 3 sides	301 or 401

TABLE V. Seam and stitching types. - Continued

Seam Placement	Seam type	Gauge	Stitch type
Knee pad pocket flap Hook tape attachment Flap attachment	 SSs-2 EFd-1 LSd-2	 1/16 to 1/8-inch from edge 3/16 to 1/4-inch gauge then Two needle topstitch, 3/16- 1/4-inch apart	 301 502, 503 or 504 301
Attachment of knee pad pockets	LSd-2	Two rows 3/16 to 1/4-inch apart	301
Bottom hemming	Efb-1	3/4 to 1-inch wide hem	301
Belt loops	Efh-1 or Efs-2	1/4-inch Gauge or Bobbin loopers on back side, 1/4-inch gauge	406 or 302 or 402
Waistband attachment	LSbc-2 or LSbc-3	1/16 to 1/8- inch from top and bottom edge of waistband	301 or 401
Waist adjustment tabs	LSbj-1	Box stitch 3/4-inch by 3/4-inch to attach webbing to elastic. Box stitch 1-3/4 inches by 3/4- inch to attach hook to webbing.	301
Hook and loop	LSbj-1	1/8 to 3/16-inch from the bound selvage	301
Cargo and lower leg pocket bellows, pleats, and cargo pocket flap facing – edge stitch all	OSf-1	1/16 to 1/8-inch from edge	301
Seat patch	LSd-2	Two rows 3/16 to 1/4-inch apart. First row of stitching shall be 1/16 to 1/8-inch from folded edge	301
Buttonhole fly – join pieces along front edge; turned in edge	SSe-2 or SSc-1	1/16 to 1/8-inch from turned in edge	301
Join left front and left fly lining along front edge; turned in edge	SSe-2 or SSc-1	1/16 to 1/8-inch from turned in edge	301
Overedge back edges of left fly lining and buttonhole fly	EFd-1	3/16 to 1/4-inch gauge	502, 503 or 504
J-stitch	LSbj-1	2 (± 1/8) inch from edge	301
Join right front and right fly lining along front edge	SSe-2 or SSc-1	1/16 to 1/8-inch from turned in edge	301
Overedge right fly raw edges	EFd-1	3/16 to 1/4-inch gauge	502, 503 or 504

TABLE V. Seam and stitching types. - Continued

Seam Placement	Seam type	Gauge	Stitch type
Crotch gusset	Ssa-1 or Ssa-2, then LSb-2	Edge stitch or safety stitch, then turn flat and topstitch, two (2) rows 3/16 to 1/4-inch apart. Stitching shall penetrate both crotch pattern pieces	301
Crotch seam	LSq-3	Join front crotch with single needle, then double needle topstitch.	301

3.9.2 Bartacking. To maintain garment durability and functionality, bartacks shall be placed as specified in Table VI. Bartacks shall be 1/8 to 3/16-inch wide.

TABLE VI. Bartack placement.

Bartack Placement	Size of Tack (inches)	Stitches per Tack	# of Bartacks per Side or Piece
All pocket flaps, except back hip pocket flap, at top on ends of topstitching (horizontal)	1/2	31-36	2
Top and bottom of all belt loops (set 1/8-inch from edge) (horizontal)	3/4	40-44	2
Fly front			
a. Horizontal, superimposed on bottom point of J-stitch of fly outside (through all layers),	1/2	31-36	1
b. Vertical, with lower end 1/4 (±1/8) - inch from base of right fly and 1/4-inch from front edge of right fly (through all fly layers not visible from front)	1/2	31-36	1
c. Horizontal, superimposed on curve of J-stitching, minimum 1/4-inch below lowest button/ buttonhole	1/2	31-36	1
Buttonhole, fly to left front lining (horizontal)			
a. Between the second and third buttonholes	1/2	31-36	1
b. Between the third and fourth buttonholes	1/2	31-36	1
Bottom of knee patch flap opening superimposed on top stitching (horizontal)	1/2	31-36	2
Drain opening at bottom edge of knee pad pocket, 1/2 to 3/4-inch apart, space centered on knee pad pocket center seam	1/2	31-36	2

TABLE VI. Bartack placement. - Continued

Bartack Placement	Size of Tack (inches)	Stitches per Tack	# of Bartacks per Side or Piece
Top of knee pad pocket opening, centered on center seam and superimposed on topstitching (horizontal)	1/2	31-36	2
Waist band to secure elastic end of adjustment tab (vertical)	1	55-60	2
Front hanging pocket opening, (meeting or overlapping pocket edge) two (2) bartacks as follows:			
a. Top opening, superimposed on waistband topstitching (horizontal)	1/2	31-36	1
b. Bottom, superimposed on side seam topstitching (vertical)	1/2	31-36	1
Cargo pocket, place three (3) vertical bartacks as follows:			
a. Top front corner	1/2	31-36	1
b. Top back corner	1/2	31-36	1
c. Anchoring barrel lock webbing, center 1-1/4 inch below top back corner	1/2	31-36	1
End of cargo pocket elastic cording, two (2) bartacks 1/4 inch apart (vertical) (through face side of pocket with cord inserted between both layers)	1/2	31-36	2
Cargo pocket pleats superimposed on facing stitching (horizontal)	1/2	31-36	2
Lower Leg Pocket (vertical)			
a. Top left	1/2	31-36	1
b. Top right	1/2	31-36	1
c. Lower corner (opposite side of bellows)	1/2	31-36	1
Back hip pocket at welt ends (vertical), superimposed on stitch line	1/2	31-36	2
Center back of leg bottom hem (vertical), securing lace (line tack also permitted)	1/2	31-36	1
Crotch/gusset junction with front & back rise seams, superimposed on gusset topstitching, through center of crotch seam	1/2	31-36	2
Knee adjustment tabs, superimposed on top-stitching close to seam.	1/2	31-36	2
Knee pad slot (vertical)	3/4	40-44	2 per pocket 4 per garment

3.10 Finished measurements. The finished pants shall conform to the measurements listed in Table VII.

TABLE VII. Finished measurements (inches).

Size	XS	S	M	L	XL	XXL	Tol.
1/2 Waist, 1/	13-3/4	15-3/4	17-3/4	19-3/4	21-3/4	23-3/4	± 1/2
Inseam, 2/							
X-Short	28	28	28	-	-	-	± 1
Short	30	30	30	30	30	30	
Regular	32	32	32	32	32	32	
Long	34	34	34	34	34	34	
X-Long	-	-	-	36	36	36	
Outseam, 3/							
X-Short	36-1/4	36-3/4	37-1/4	-	-	-	± 1
Short	38-3/4	39-1/4	39-3/4	40-1/4	40-3/4	41-1/4	
Regular	41	41-1/2	42	42-1/2	43	43-1/2	
Long	43-1/4	43-3/4	44-1/4	44-3/4	45-1/4	45-3/4	
X-Long	-	-	-	47-1/4	47-3/4	48-1/4	
1/2 Leg Opening 4/	8-1/2	8-1/2	8-7/8	8-7/8	9	9-1/2	± 1/2

NOTE: The garment shall have fly waistband button and cargo pockets buttoned, placed flat upon a table and measured as follows:
1/ 1/2 Waist - With adjustment tabs relaxed, fold 1/2-inch from center front button and lay flat. Measure along center of waistband from outside folded edge to folded edge.
2/ Inseam - Measure inseam of pants from point where front crotch seam joins the gusset to bottom edge of pant along the inseam. Walk measuring tape along the seam.
3/ Outseam - Measure from top edge of waistband to bottom of leg along outseam in 2 steps, waist seam to knee seam and knee seam to bottom edge.
4/ Leg Opening - Measure across bottom of leg from outside folded edge to inside folded edge.

3.11 Workmanship. The finished Pant Combat Advanced shall be uniform in quality and shall conform to the quality of product established by this specification. After completion of the final assembly, the pant shall be thoroughly cleaned and all thread scraps, lint and foreign matter shall be removed and all closures engaged prior to packaging. The occurrence of defects, as specified in 4.4.1, shall not exceed the criteria specified in the contract or purchase order.

4. VERIFICATION

4.1 Classification of inspection. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.2).
b. Conformance inspection (see 4.3)

4.2 First article inspection. First article, submitted in accordance with 3.1 shall be inspected for compliance with design, workmanship and dimensional requirements. The presence of excessive defects, as defined by contract (see 6.2) or failure to pass any test shall be cause for rejection of the first article. The sample size shall be specified in the procurement document (see 6.2). The sample unit shall be one (1) pair of pants and the lot size shall be expressed in units of pants.

4.3 Conformance inspection. Conformance inspection shall include the examination of 4.4.1 and the finished measurements in Table VII as applicable. Sampling for inspection shall be performed in accordance with ASQ /ANSI Z1.4 and with acceptance quality limits as specified in the contract and/or order, except where otherwise indicated. (See 6.2)

4.4 Component and end item inspections. In accordance with 4.3, components and materials in the end items shall be tested in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified or qualified in this document or applicable procurement documents. The Government reserves the right to inspect all components and end items to determine conformance to requirements.

4.4.1 End item visual examination. Each pair of pants shall be examined for the defects in Table VIII, which are clearly noticeable at normal viewing distance (3 feet) or affect serviceability and appearance of the garment. Material defects shall be in accordance with ASTM D3990. If needed, closer inspection will be performed to verify compliance to specification requirements.

TABLE VIII. End item visual examination.

Examination	Defect	Classification	
		Major	**Minor**
Material	Incorrect, not as specified (see 3.4.1 and 3.4.1.1)	101	
	Hole, cut, tear, smash, burn, needle chew, exposed drill hole, run, thin place, dye streak, color not as specified, misweave, visible mend	102	
	Knots greater than Fabric Defect Scale Level C		201
	Slubs greater than Fabric Defect Scale Level D		202
Shade	Shade variation within part or between parts of pant, affecting appearance or serviceability	103	
Components	Component not in accordance to the specification	104	
Tape, Cord, and Braid	Any tape or cord distorted, full, tight, or twisted		203
Barrel Lock	Misplaced or omitted	105	
	Color or type not as specified		204
Fastener Tape, Hook and Loop	Misplaced, damage, frayed, spliced or omitted	106	
	Color or type not as specified		205
	Tape piece edges not cut straight (at 90 degrees)		206
Elastic Webbing	Misplaced, damage, frayed, spliced or omitted	107	
	Color or type not as specified		207
Thread/Gimp	Color or type not as specified		208
Buttons	Damaged or ragged	108	
	Not specified type, size or color		209

TABLE VIII. End item visual examination. - Continued

Examination	Defect	Classification Major	Minor
Patch Kit	Omitted	109	
	Not placed in correct pocket or position		210
	Patch color, type or packaging not as specified		211
Labels, Hangtags, Bar code/UPC/HRI Codes	Omitted, incorrect, illegible,	110	
	Color or type not as specified		212
	Human readable interpretation (HRI) illegible	111	
Construction	Any construction part of the pant omitted (3.6.1 to 3.6.12)	112	
Fastener tape, hook and loop	Twisted or distorted when closed	113	
	Out of alignment causing bulge		213
	Joining pieces out of alignment with each other by more than 1/4-inch	114	
	Not stitched to pant as specified	115	
	Stitching on tape selvage rather than hook or loop.	116	
	Tape stitched less than 1/8 inch or more than 3/16 inch from edge	117	
Waistband and adjustment tabs	Incorrect design (not as specified in patterns, not secured, not specified width) Waistband grain lines not matching to pant	118	
	Waistband button/buttonhole alignment uneven by more than 1/4-inch when buttoned	119	
	Waistband adjustment tabs omitted	120	
	Waistband adjustment tabs not constructed as specified		214
Belt loops	Belt loops omitted, not secured, not specified size, opening not as specified or incorrect placement, belt loop bartack goes through elastic of waistband adjustment tab	121	
Fly	Incorrect design not specified in patterns, not secured, missing or skewed J stitch line	122	
Seat Patch	Seat Patch omitted	123	
	Not attached as specified, not aligned at top more than 1/4-inch	124	
Knee Patch	Knee Patch omitted, not attached as specified, opening not as specified	125	

TABLE VIII. End item visual examination. - Continued

Examination	Defect	Classification Major	Minor
Pocket and Flaps (all)	Pocket construction and openings not as specified	126	
	Pocket parts and openings not uniform in size or shape by 1/4-inch	127	
	Pocket flaps or openings not as specified	128	
	Pocket flaps twisted, curled or puckered, not stitched as specified or not well formed	129	
	Pocket flaps not completely covering pocket opening left to right, positioned or grain line not as specified	130	
	Pocket flap finished uneven from left to right more than 1/4-inch	131	
Front Hanging Side Pockets	Raw edge not overedged	132	
Hip Pocket	Omitted, or incorrect size	133	
	Missing or incorrect placement of eyelet, hook and loop	134	
Cargo Pockets	Omitted or incorrect size	135	
	Missing edge stitch on pleats, missing or incorrect placement of eyelet, hook and loop, barrel lock, or cord		215
Barrel locks/cord	Incorrect placement of barrel lock,	136	
	Barrel lock not secured/set,	137	
	Barrel lock not functional	138	
	Barrel lock cord not knotted properly and secured		216
Lower Leg Pockets	Omitted or incorrect size	139	
	Missing or incorrect placement of eyelet, or hook and loop		217
Hem/Bottom opening/Inseam and Outseam	Hem not as specified, or missing drawstring	140	
	Right and Left Bottom openings varying more than 1/2-inch in width.	141	
	Right and Left Inseam and outseam lengths varying by more than 1/2-inch	142	
Eyelets	Omitted, misplaced or incorrect size	143	
	Loose stitching, incorrect number of stitches		218
	Eyelet hole not cut through		219
Bartacks	Omitted, misplaced or incorrect size	144	
	Loose stitching, incorrect number of stitches		220

TABLE VIII. End item visual examination. - Continued

Examination	Defect	Classification Major	Minor
Buttonholes	Omitted, misplaced or incorrect size	145	
	Button holes not in specified direction		221
	Loose buttonhole thread, purling on wrong side, not clean cut or securely caught in fabric	146	
	Alignment of buttonholes and buttons causing bulge, twist or distortion when engaged	147	
	Buttonholes not cleanly cut to required opening size		222
Labels/ Hangtags/ UPC/HRI Codes	Size, combination identification/care labels not placed correctly		223
	Hangtags/UPC labels not placed securely attached in correct position		224
	Barcode/UPC code not visible on folded, packaged item		225
	Any label or tag having incorrect printed content	148	
	Any label, hangtag, or barcode attachment causing damage to item	149	
Seams and Stitching	Open seams, puckered, distorted, wavy, twisted, or irregular	150	
	Loose or tight stitch tension		
	Less than 1/2-inch in length		226
	Greater than 1/2-inch in length	151	
	Missing stitches greater than 1/4-inch length	152	
	Edge or raised stitching sewn too close to the edge or needle chew resulting in damage to fabric over 1/4-inch in length	153	
	Seam allowance not as required by stitch type		227
Seams and Stitching, continued	Visible raw edge on outside of pant (inside raw edge greater than 1-inch)	154	
	Stitching not as specified	155	
	Double needle intersecting seams staggered by more than 1/4-inch	156	
	Run off of stitching more than 1/2-inch for edge or raised stitching	157	
	Stitching caught in components or fabric causing unwanted permanent folds, pleats or fullness in the garment	158	
	Free floating stitching not secured in a seam or other stitching by less than 1/4-inch or ends of a continuous line of stitching not overlapped over 1/2-inch (except label stitching)	159	
	Stitching of seams incorrectly repaired	160	

TABLE VIII. End item visual examination. - Continued

Examination	Defect	Classification Major	Minor
Cleanness/ Workmanship	Spot/Stain affecting appearance or serviceability	161	
	Odor	162	
	Excessive thread ends (more than 3) Between 1/4 to 1-1/2 inch		228
	Excessive thread ends (more than 3) Over 1-1/2 inches	163	
	All closures on pant not engaged		229
Packaging	Any pant not packaged in accordance with contract or purchase order		230

4.4.2 Component testing. The cloth components shall be tested for the characteristics listed in Table IX. The methods of testing as specified wherever applicable and as listed in Table IX shall be followed. All test reports shall contain the individual values utilized in expressing the final results. The sample unit shall be five (5) continuous yard's full width of the finished cloth for all physical and chemical tests. The lot shall be unacceptable if one or more sample units or the lot average fail to meet any requirement specified. The sample size shall be in accordance with the following:

Lot size (yards)	Sample size (sample units)
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

TABLE IX. Component tests.

Characteristic	Requirement paragraph	Test method
Materials 3.4.2 and 3.4.3		
Weave	3.4.2	Visual
Weight	Table I	ASTM D3776/D3776M (Method C)
Yarns per Inch	Table I	ASTM D3775
Breaking Strength	Table I	ASTM D5034 (G-E or G-T)
Tearing Strength	Table I	ASTM D1424
Bursting Strength	Table I	ASTM D3787
Abrasion Resistance	Table I	ASTM D3884, H18 Wheel, 250g/Weight
Dimensional Stability After five (5) cycles	Table I	AATCC TM135, 3, V, Aiii

TABLE IX. Component tests. - Continued

Characteristic	Requirement paragraph	Test method
Air Permeability	Table I	ASTM D737
Flame Resistance Initial After laundering (25 cycles)	Table I	 ASTM D6413/D6413M AATCC TM135, 3, V, Aiii & ASTM D6413/D6413M
Material 3.4.5		
Construction	3.4.5	Visual
Fiber Content	3.4.5	AATCC TM20
Weight	3.4.5	ASTM D3776/D3776M (Method C)
Material 3.4.6		
Fiber Content	3.4.6	AATCC TM20
Weight	3.4.6	ASTM D3776/D3776M (Method C)
Thickness, inches	3.4.6	ASTM D1777
Courses per inch	3.4.6	ASTM D3774
Bursting Strength	3.4.6	ASTM D3787
Dimensional Stability	3.4.6	AATCC TM135 3,V,Aiii
Shear Strength, lbs./sq. inch After three (3) launderings	3.4.6	 AATCC TM61 Test 3A and ASTM D5169
Peel Strength lbs./inch After three (3) launderings	3.4.6	 AATCC TM61 Test 3A and ASTM D5170
Cord, elastic: (All types)		
Width/diameter	3.5.1.5	Visual/micrometer
Weight (oz./lin. yd.)	3.5.1.5	ASTM D3776/D3776M
Elongation	3.5.1.5	1/
Picks/inch	3.5.1.5	ASTM D3775
# of carriers	3.5.1.5	Visual
Ends/per carrier	3.5.1.5	Visual
# of strands	3.5.1.5	Visual
Color shade matching	3.5.1.5	AATCC EP 9, Option A (2012)
Cut length	3.5.1.5	Calibrated ruler

1/ Elastic cord elongation test. Cut a 14-inch specimen from a representative sample cord and make two marks on the cord so that a distance of 10-inches is between the gauge marks. Suspend the cord from a clamp in such a manner as to allow a 2-pound weight to be hung on the lower end of the cord. Gradually lower the weight until the entire load is carried by the cord. After 2 minutes, take a measurement between the two marks and calculate the increase in length as follows:

$$\text{Elongation (\%)} = \frac{B-A}{A} \times 100$$

Where:

A = Initial measurement

B = Measurement of elongation at 2 pounds

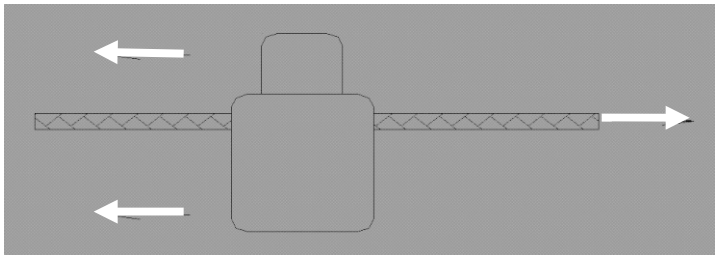
4.4.3 End item testing. The finished pant shall be tested for the characteristics listed in Table X. The methods of test shall be as specified in Table X. All test reports shall contain the individual values utilized in expressing the final results. The testing requirements and test sampling plan shall be as specified in the contract or purchase order.

TABLE X. End item tests.

Characteristic	Requirement paragraph	Test method
Barrel lock Barrel lock dimensions	3.5.2 3.5.2	4.5.1 Calibrated ruler
Button pull/break	3.5.6	ASTM D5034
Flat buckle dimensions	3.5.8	Calibrated ruler

4.5 Methods of Inspection.

4.5.1 Barrel lock test. The barrel lock holding strength shall be tested as follows:



Barrel lock holding strength: Using tensile testing machine (in accordance with ASTM D5034) at 2 inches/minute, either pull-up cord on stationary engaged cord-lock or vice-versa (see above illustration.).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of material is to be performed by DoD or in-house personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The Pant Combat FR Advanced is for wear by military personnel as a combat uniform in garrison and combat missions.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this Purchase Description document.
b. Sizes required (see 1.2).
c. The specific issue of individual documents referenced (see 2.2).
d. When first article is required (see 3.1, 4.2).
e. Conformance inspection acceptance quality limits (AQL) (see 4.3)
f. Packaging (see 5.1).

6.3 Staflex ® 4038 from Harodite Finishing Company, Inc., 66 South Street North Dighton, MA 02764 US, (508) 824-6961, http://www.harodite.com, is known to meet the requirements of 3.4.5.

6.4 Integrated Patch Kit from Source One Tactical, 3280 Fairlane Farms Road, Wellington, FL 33414, (561) 753-6656, is known to meet the requirements of 3.6.12.

6.5 Subject term (key word) listing.

Camouflage Pattern (OCP)
Clothing Operational

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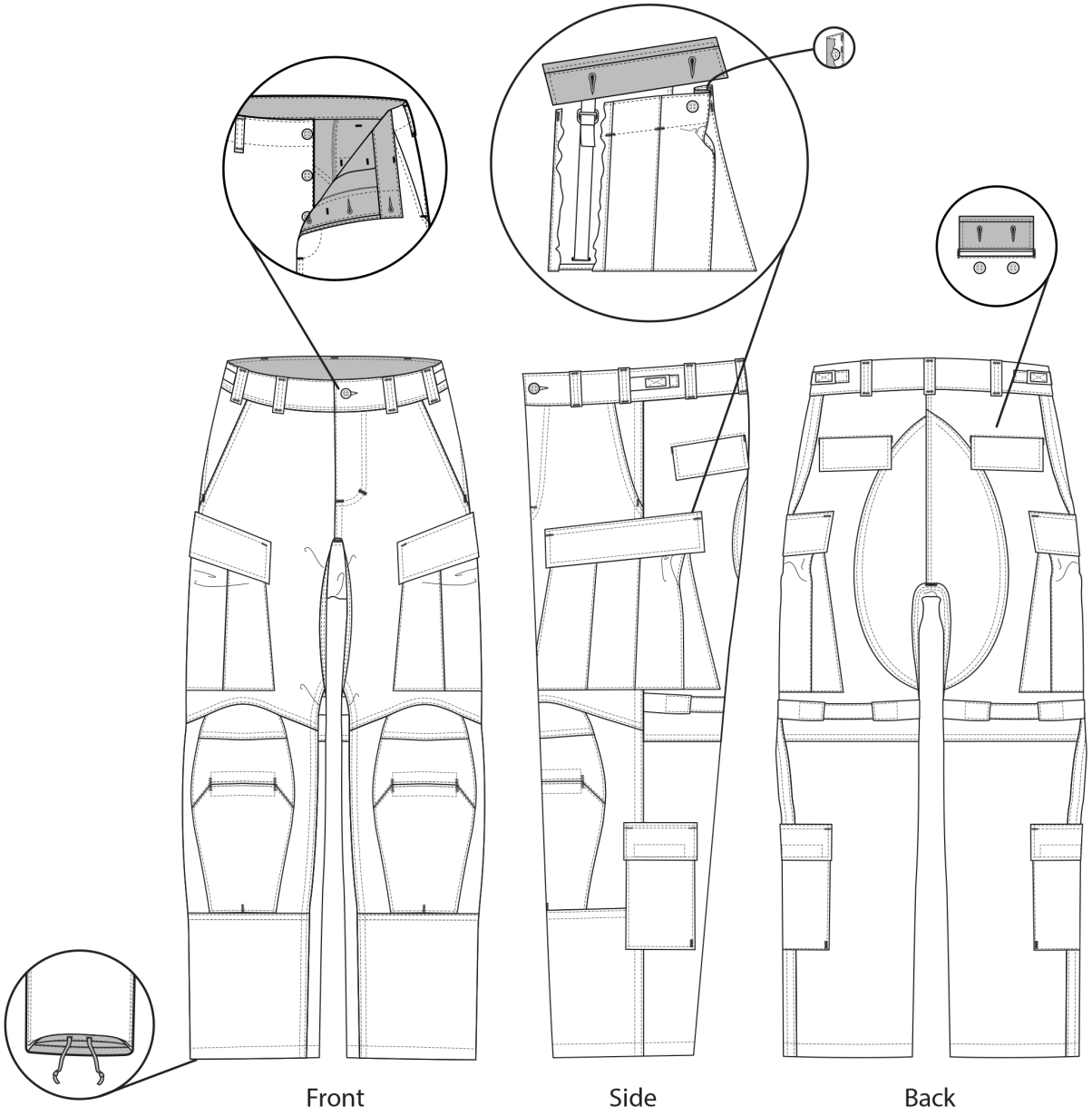


FIGURE 1. Pants, Combat, Flame Resistant, Advanced.

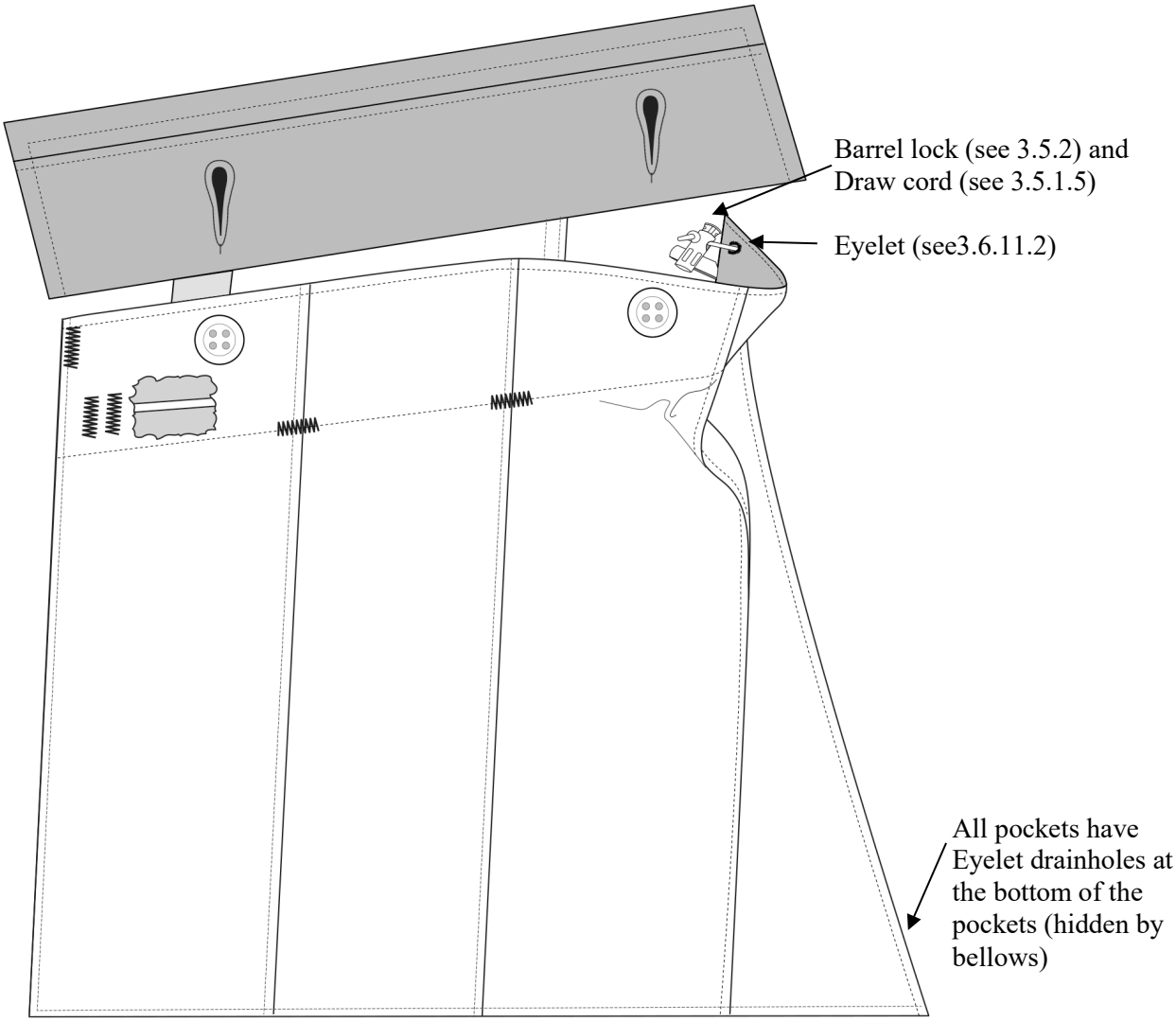
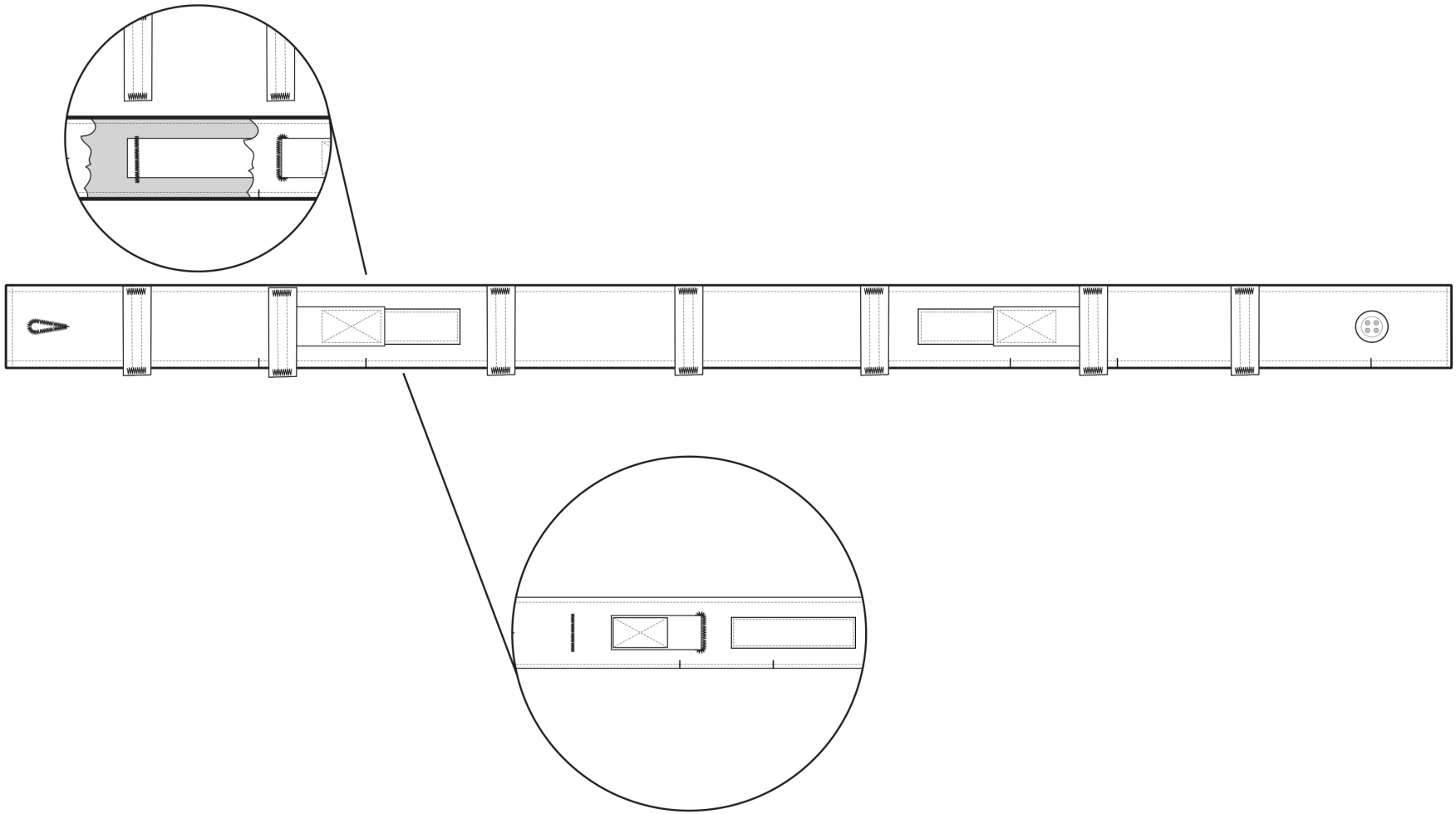


FIGURE 2. Pants, Combat, Flame Resistant, Advanced, Cargo Pocket Details.

X-ray view of internal elastic construction.



Tab open and details hidden by belt loops.

FIGURE 3. Waistband Details of Pants, Combat, Flame Resistant, Advanced.

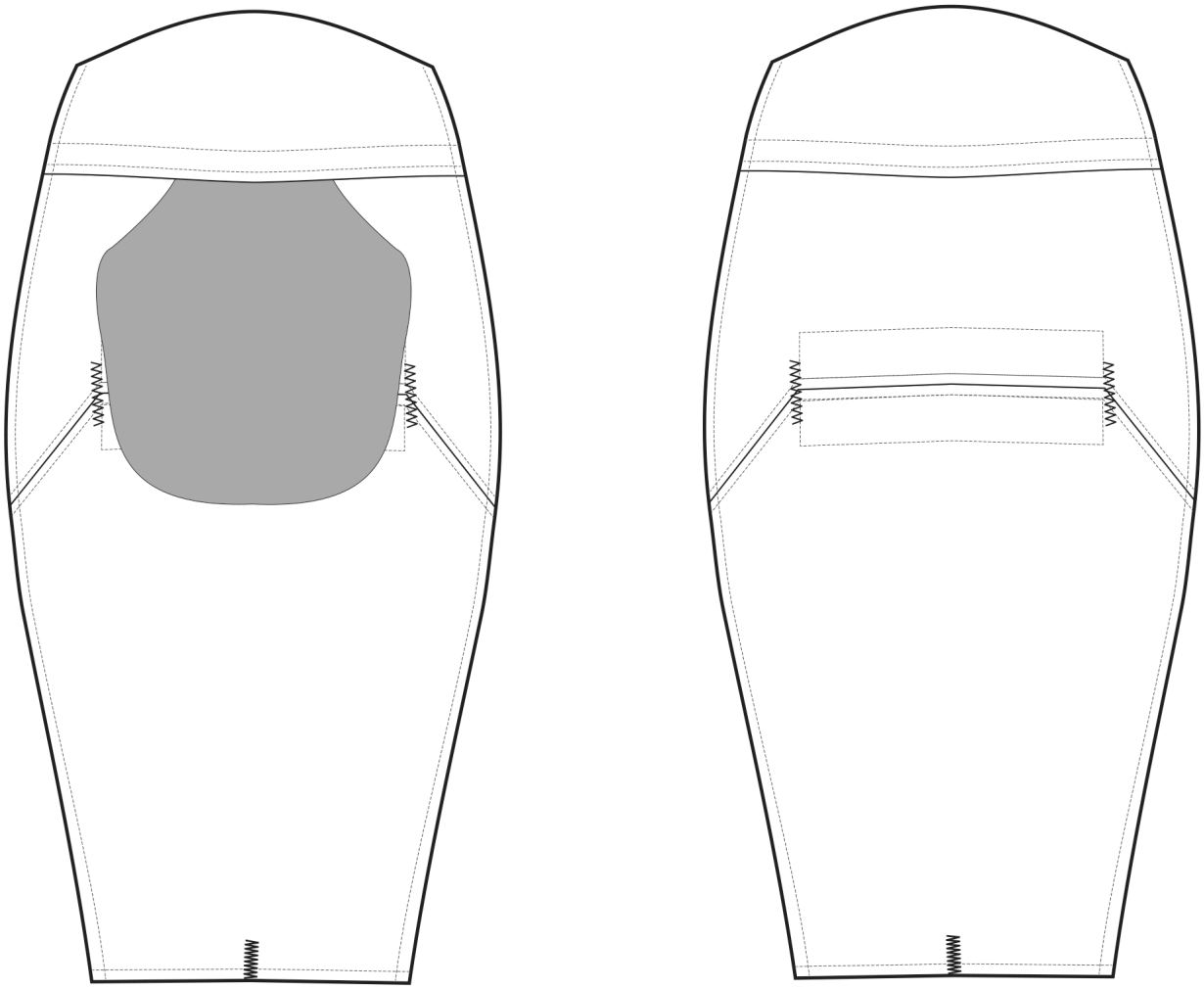


FIGURE 4. Kneepad Housing (with and without knee pad).

CUSTODIAN:
Army – GL
Air Force - 11

PREPARING ACTIVITY:
DLA – CT